

HOUSEHOLD WATER SECURITY: A CASE STUDY OF IBADAN SOUTH WEST LOCAL GOVERNMENT

¹Amao, I.O and ²Omonona, B.T.

¹National Horticultural Research Institute, Ibadan, Nigeria, Department of Agricultural Economics, University of Ibadan, Ibadan, Nigeria,

ABSTRACT

Household water security is a relatively new concept in water demand management literature for both developed and developing countries. The study examined household water security in Ibadan Southwest Local Government Area of Oyo State. A random sampling technique was used to select 40 households from the study area. Well structured questionnaires were used to obtain information from the households. Descriptive as well as inferential statistics were used to analyze the results of the study. Most of the respondents were male (65.0%), married (87.5%) and within 41-50 years (42.5%). A large percentage of these respondents have average household size of 5-10 members (60%), have a maximum of 4 children in the household (80.0%) and have attained Senior School Certificate (SSC) or Ordinary National Diploma (OND) (45%) level of education. The study further revealed that number of children in the household was found to significantly affect household water consumption, while number of males was negatively significant. Rainwater (26.2%) was the most common source of water available to households. Drinking water was mostly sourced from borehole (32.8%) and water keg (70.0%) was the mostly used storage facility. Also, households collected water from less than 1km distance (57.5%); 60% use a maximum of 4 children and 85.5% involve at most 4 females to collect water for household consumption. Thus, more improved sources of water such as piped water in-house should be made available to households in the study area to improve access to water for all household uses.

KEYWORDS: household water security, water availability, water access, water storage.

INTRODUCTION

Water is literally the source of life on earth. The human body is 70% water. People begin to feel thirsty after a loss of only 1% of bodily fluids and risk death if fluid loss nears 10% (Park, 2002). Water is a basic human right. Without it societies wither and people die (Joanne, 2000). Man needs water for drinking, cooking, bathing, sewage disposal, irrigation for agriculture, industrial uses and for recreational purposes amongst many other uses (Aderibigbe *et al*, 2008).

Household water security envisages availability of water as the central focus. However, this does not mean that mere availability of water is sufficient to meet the household water security. The idea of water security allows water to be considered as a natural resource commodity and entitlement. These are all complementary perspectives that go to establish household water security. There are three critical factors that determine household water security-availability, accessibility and usage. The degree of combination of these factors will determine the Household Water Security (HWS) at a given point of time. (Ariyabandu, 2001).

Particularly, in Ibadan Nigeria, there has been inadequate provision and management of environmental infrastructure - Unrepaired water pipes, inability to generate sufficient funds, erratic power supply, and poor management which has prevented over half of Ibadan's residents from having access to potable water, with its attendant health and economic problems (UN-HABITAT, 2010). Thus, the purpose of the study was to examine household water security in Ibadan city and specifically, the Ibadan South West Local Government Area, one of the local governments in the metropolis. Specifically, the following objectives were addressed:

To examine the socio-economic characteristics of households in the study area.

- To examine the influence of socio-economic and demographic factors on household water consumption.
- To identify the sources of water, its usage pattern, storage and access in the study area.

METHODOLOGY

The Study Area

Ibadan South West Local Government Area was carved out of the defunct Ibadan Municipal Government (IMG) in 1991. The Administrative Headquarter is located at Oluyole Estate. It covers a landmass of 133.5 square kilometers with a population density of 2,401 persons per square kilometer. The 2010 estimated population for the area was projected 320,536 people, using a growth rate of 3.2% from 2006 census. The Local Government Area is bounded by Ibadan North West and Ido Local Government Areas to the north, Oluyole Local Government in the south, Ido Local Government Area in west and Ibadan North and South East in the east (Oyo State Government, 2010).

The local government was purposively selected for the study based on the investigator's experience in the study area. 40 households were randomly selected and structured questionnaires were administered to them based on the specific objectives of the study.

Frequencies, percentages and a linear regression model were used to analyze the data.

The linear regression model used in the analysis is specified as follows:

$$Y = f(X_i, U_i)$$

Where, Y is the quantity of water consumed by the household, X_i includes, age, marital status, level of education, religion, household size, number of children in household, number of males in household, number of females in household, occupation of household head, average monthly expenditure, household water expenditure and U_i is the error term.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

In the study area as indicated in Table 1, most of the respondents were male (65.0%), married (87.5%) and within 41-50 years (42.5%). A large percentage of these respondents were also Christians (72.5%), have average household size of 5-10 members (60%), have a maximum of 4 children per household (80.0%) and have attained Senior School Certificate (SSC) or Ordinary National Diploma (OND) (45%) level of education. In addition, most sampled household heads in the study area are civil servants (40%), 52.5% of respondents indicated an average monthly expenditure (₦20,000 - ₦50,000) and household water expenditure of less than ₦500 (30%).

Table 1: Socio-economic characteristics of households

Variable	Frequency	Percentage
Age of respondent		
30-40	13	32.5
41-50	17	42.5
51-60	8	20.0
>60	2	5.0
Gender of respondent		
Female	14	35.0
Male	26	65.0
Marital Status		
Single	2	5.0
Married	35	87.5
Divorced	1	2.5
Widowed	2	5.0
Level of Education		
No formal education	1	2.5
Primary Education	5	12.5
SSC/OND	18	45.0
HND/B Sc	14	35.0
M Sc/PhD	2	5.0

Table 1 <i>Cont</i>		
Religion		72.5
Christianity	29	27.5
Islam	11	
Household size		
1-4	16	40.0
5-10	24	60.0
Number of children in household		
1 – 4		
5 – 10	32	80.0
	8	20.0
Occupation of household head		
Civil service		
Trading	16	40.0
Artisan	3	7.5
Others	13	32.5
	8	20.0
Average monthly expenditure		
<₦10,000	1	2.5
₦10,000 – ₦20,000	16	40.0
₦20,000 – ₦50, 000	21	52.5
> ₦50,000	2	5.0
Household water expenditure		
None	8	20.0
<₦500	12	30.0
₦500 - ₦1,000	7	17.5
₦1,000 - ₦2,000	4	10.0
₦2,000 - ₦3,000	5	12.5
>₦3,000	5	12.5

Source: Field survey data, 2010.

Influence of socio-economic and demographic factors on household water consumption

From Table 2, both number of children and males in the household have significant effect on household water consumption. However, as the number of males in the household increases, household water consumption reduces. This is because female household members are more involved in sourcing for water than the males as seen in the gender composition of carriers. Studies have shown that children and women are the key players involved in sourcing for water in the household (UNICEF Nigeria, 2010).

Table 2: Influence of socio-economic and demographic characteristics on household water consumption

Variable	Co-efficient	t-value
Constant	223.247	0.846
Age	-1.592	-0.681
Marital status	-31.563	1.096
Level of education	-33.418	-0.633
Religion	-23.371	-1.188
Household size	-23.057	-0.422
Number of children in household	87.133	1.793*
Number of males in household	-42.173	-2.127**
Number of females in household	1.750	0.085
Occupation of household head	7.994	0.477
Average monthly expenditure	0.003	1.298
Household water expenditure	0.000	-0.034

Source: Field survey data, 2010. * - significant at 10%, ** - significant at 5%.

Water Sources

The survey found that households use water from multiple sources (Table 3). The sources of domestic water supply in the household ranges from rainwater to public tap. The most commonly used source is rainwater (26.2%) followed by hand dug well (24.3%), borehole (19.6%), piped water in-house (10.3%), water from neighbors (10.3%), water from private vendor (6.5%) and public tap (2.8%). No household indicated the use of water from rivers, streams and ponds; this might be due to their location which is urban.

Table 3: Sources of water in Ibadan South West Local Government

Sources of water	Frequency	Percentage
Piped water in-house	11	10.3
Public tap	3	2.8
Private water vendor	7	6.5
Water from neighbors	11	10.3
Hand dug well	26	24.3
Borehole	21	19.6
Rivers, streams and ponds	-	-
Rainwater	28	26.2

Source: Field survey data, 2010. Multiple responses

Water usage pattern

As shown in Table 4, households in the study area use water from different sources for more than one activity; hand dug well, borehole and rainwater are important sources for households. For drinking, most households use borehole (32.8%), piped water in-house (16.4%) as well as rainwater (16.4%). Cooking, bathing, washing and other domestic activities, hand dug well is prominently used (50%) as indicated in Table 4.

Table 4: Water sources by pattern of usage in Ibadan South west Local Government

Water source and usage pattern	Drinking	Cooking	Bathing	Washing	Other domestic uses
Piped water in-house	11(16.4%)	6 (11.5%)	5 (9.3%)	6 (9.8%)	2 (8.3%)
Public tap	1(1.5%)	1(1.9%)	1(1.9%)	1(1.6%)	-
Private water vendor	5(7.5%)	6 (11.5%)	4(7.4%)	6(9.8%)	2(8.3%)
Hand dug well	6(9.0%)	16(30.8%)	26(48.1%)	27(44.3%)	12(50%)
Borehole	22(32.8%)	15(28.8%)	5(9.3%)	4(6.6%)	2(8.3%)
Rivers, streams and ponds	-	-	-	-	-
Rainwater	11(16.4%)	8(11.5%)	13(24.1%)	17(27.9%)	8(33.3%)

Source: Field survey data, 2010.

Water storage facilities

Water storage is a coping strategy to enhance continuous availability and reliability (Osei-Asare, 2004). Table 5 shows that keg was the most commonly used storage facility (70.0%) followed by storage tank (34.1%) however; some households use more than one storage facility.

Table 5: Water storage facilities

Storage facility	Frequency	Percentage
Keg	25	70.0
Storage tank	14	34.1
Water trough	12	29.3
Earthen pot	-	-

Source: Field survey data, 2010. Multiple responses

Water access

Time allocated to water collection would differ among households depending on its location (distance to source), ease of accessibility and household characteristics such as number of water carriers and their gender (Osei-Asare, 2004). Thus, water accessibility was examined considering distance to source of water, and household characteristics such as number of children, males and females involved in collecting water for household use.

Distance to source

From Table 6, it was observed that 37.5% of respondents collected water from within their residential area while about 57.5% get theirs from a distance of 1km or less; the remaining 5% collect water from over 1km distance. This might be due to the fact that rainwater, borehole and hand dug well are the most common sources of water available to the households.

Table 6: Distance to source of water

Distance to source	Frequency	Percentage
None	15	37.5
< 1km	23	57.5
>1km	2	5.0
Total	40	100

Source: Field survey data, 2010.

Household characteristics and water access

About 60% of the households use a maximum of 4 children to collect water, 25% do not involve children at all and 15% use more than 4 children (Table 7). This is as shown in the maximum number of children found within the households which is 4 (from Table 1).

Table 7: Number of children involved in water collection

Number of children	Frequency	Percentage
None	10	25.0
1-4	24	60.0
5-8	6	15.0
Total	40	100.0

Source: Field survey data, 2010.

Gender composition of water carriers

Table 8 shows that 77.5% and 85.5% of households involve a maximum of 4 male and 4 female household members respectively for water collection. Studies have shown that females (girls and women) are more involved in water collection in the household (UNICEF Nigeria, 2010, Osei-Asare, 2004).

Table 8: Gender composition of water carriers

Number of male water carriers	Frequency	Percentage	Number of female water carriers	Frequency	Percentage
None	8	20.0	None	4	10.0
1 – 4	31	77.5	1 – 4	33	85.5
> 4	1	2.5	> 4	3	7.5
Total	40	100.0	Total	40	100.0

Source: Field survey data, 2010.

SUMMARY AND CONCLUSION

Most respondents are male (65.0%), married (87.5%), of 41-50 years of age (42.5%), Christians (72.5%), have SSC/OND as their highest level of education, are civil servants (45.0%), have household size of 5-10 (60.0%), have ₦16,000 - ₦20,000 as their maximum average monthly expenditure (22.5%) and spend ₦100 - ₦500 monthly on water. Number of children and males in the household significantly influence household water consumption but, number of males in household has a negative effect on household water consumption. The main sources of water

available in the locality include rainwater, borehole and hand dug well. Borehole is the most common drinking water source while keg is the most frequently used storage facility. A large percentage of households spend about 10 minutes to collect water from a distance of less than 1 km. It was also observed that 60% of households use maximum of 4 children to collect water while 85.5% involve at most 4 female household members.

Thus, more improved sources of water such as piped water in-house should be made available to households in the study area so that they will be able to get better access to water for all household uses. The Oyo State Government should resolve the issues of un-repaired water pipes, inability to generate sufficient funds, erratic power supply, and poor management which has prevented over half of Ibadan's residents from having access to potable water.

REFERENCES

Aderibigbe, S.A., Awoyemi, A. O. and Osagbemi, G.K. (2008); Availability, Adequacy and Quality of Water Supply in Ilorin Metropolis, Nigeria. EuroJournals Publishing, Inc. 2008, European Journal of Scientific Research, ISSN 1450-216X Vol.23 No.4 (2008), pp.528-536, <http://www.eurojournals.com/ejsr.htm>.

Ariyabandu, R. De. S. (2001); Household water security using rainwater harvesting; retrieved from <http://www.lankarainwater.org/pubs/hwsurwh2001.pdf> on 9th April 2010.

Joanne G. (2000); Global Environment Outlook. 2000. UNEP.

Osei- Asare, Y. B. (2004); Household Water Security and Water demand in the Volta Basin of Ghana; PhD thesis, 2004, pp 3, pp51-55., retrieved from http://www.glowa-volta.de/fileadmin/template/Glowa/Downloads/thesis_osei on 9th April, 2010.

Oyo State Government (2010): Ibadan South west local Government retrieved from <http://www.oyostate.gov.ng/government/Ibadan-south-west> on 19 May, 2010.

Park K. (2002) Environment and Health In: Park's Textbook of Preventive and Social Medicine. Eds. 2002 (17).

UN-HABITAT (2010); Ibadan – Mobilizing Resources through a Technical Coordinating committee retrieved from <http://ww2.unhabitat.org/programmes/uef/cities/summary/ibadan.htm> on 20 May, 2010.

UNICEF (2009); Water, Sanitation and Hygiene: Water Supply; retrieved from http://www.unicef.org/wash/index_watersecurity.html on 9th April, 2010.

UNICEF Nigeria (2010): Safe water saves children's lives, says UNICEF as it celebrates World Water Day with Nigeria retrieved from http://www.unicef.org/nigeria/media_4122.html on 19 April, 2010.

Received for Publication: 12/04 /2010

Accepted for Publication: 15/05 /2010

Corresponding Author:

Amao, I.O

National Horticultural Research Institute, Ibadan, Nigeria

Email: ifeluv@yahoo.com